CLAIMS

1. A voltage-controlled oscillator (VCO) oscillating at an oscillator frequency comprising

- an LC-resonant circuit with at least one inductor (L_1)

- a controllable switching means (S_v) which is arranged in the LC-resonant circuit in such a way that it periodically has a conducting and a non-conducting state at the oscillator frequency and has a control input (V_{con}) connected to a variable dc voltage, the control voltage U_{con}, and

- a further inductor (L_2) which can be periodically switched in parallel or in series with the inductor (L_1) by way of the switching means (S_v) actuated at the oscillator frequency.

2. A voltage-controlled oscillator (VCO) as set forth in claim 1 characterized in that a further inductor (L_2) can be periodically connected in parallel or in series with a plurality of inductors (L_1) by way of a respective controllable switching means (S_v) at the oscillator frequency and the controllable switching means (S_v) are controllable by a variable control voltage U_{con}.

3. A voltage-controlled oscillator (VCO) as set forth in claim 1 characterized in that the relationship of the duration of the conducting state and the duration of the non-conducting state of the switching means (S_v) within an oscillation period of the oscillator (VCO) is variable in dependence on the control voltage U_{con}.

4. A voltage-controlled oscillator (VCO) as set forth in one or more of the preceding claims characterized in that the time-averaged effective inductance is variable in dependence on the control voltage U_{con} in accordance with the relationship of the duration of the conducting state and the duration of the non-conducting state of the switching means (S_v) within an oscillation period of the oscillator (VCO).

5. A voltage-controlled oscillator (VCO) as set forth in one or more of the preceding claims characterized in that the controllable switching means (S_v) are switching transistors, in particular MOSFETs.

6. A voltage-controlled oscillator (VCO) as set forth in one or more of the preceding claims characterized in that gate terminals (G) of the MOSFETs are connected to the control input (V_{con}) of the control voltage U_{con}.

7. A voltage-controlled oscillator (VCO) as set forth in one or more of the preceding claims characterized in that source terminals (S) of the MOSFETs are connected to parts of the circuit arrangement carrying the oscillator frequency.

8. A voltage-controlled oscillator (VCO) as set forth in one or more of the preceding claims characterized in that the oscillator (VCO) is of a CMOS or bipolar technology.

9. A voltage-controlled oscillator (VCO) as set forth in one or more of the preceding claims characterized in that the oscillator (VCO) is used in frequency synthesizers for wide-band systems and for multi-band uses and for clock production and clock recovery in high-speed circuits such as for example microprocessors and memories.

10. A voltage-controlled oscillator (VCO) as set forth in one or more of the preceding claims characterized in that in addition to the voltage-controlled inductance a voltage-controlled capacitance is integrated in the oscillator (VCO), which is connected to a tuning voltage U_{tune} by way of a further control input, the tuning input (V_{tune}).

11. A voltage-controlled oscillator (VCO) as set forth in claim 10 characterized in that the voltage-controlled capacitance is embodied by means of at least one variable capacitor diode, in particular by means of two p-MOSFETs (M_1, M_2), wherein the effective capacitance depends on the tuning voltage U_{tune} at the tuning input (V_{tune}).

12. A voltage-controlled oscillator (VCO) as set forth in one or more of the preceding claims characterized in that the tuning input (V_{tune}) of the oscillator (VCO) is connected to an output of a phase-locked loop (PLL) and the output of the voltage-controlled oscillator (VCO) is connected to an input of the phase-locked loop (PLL).

13. A voltage-controlled oscillator (VCO) as set forth in one or more of the preceding claims characterized in that the noise of the control voltage at the control input (V_{con}) is blocked out by means of a high capacitance between the control input (V_{con}) and ground.

14. A voltage-controlled oscillator (VCO) as set forth in one or more of the preceding claims characterized in that the tuning input (V_{tune}) of the voltage-controlled oscillator (VCO) is connected to the output of the phase-locked loop (PLL; PLL1) and the control input (V_{con}) of the voltage-controlled oscillator (VCO) is connected to an output of a further phase-locked loop (PLL2).